PATENT **MS307116.01/MSFTP2299US**

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Date: January 22, 2009 /Luke Clossman/
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:			
Applicant(s):	David G. Conroy	Examiner:	Li B. Zhen
Serial No:	10/717,830	Art Unit:	2194
Filing Date:	November 20, 2003	Conf. No:	8567

Title: DEVICES AS SERVICES IN A DECENTRALIZED OPERATING SYSTEM

Mail Stop Appeal Brief-Patents
Commissioner for Patents
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APPEAL BRIEF

Dear Sir:

Applicant's representative submits this brief in connection with an appeal of the above-identified patent application. Payment is being submitted via credit card in connection with all fees due regarding this appeal brief. In the event any additional fees may be due and/or are not covered by the credit card, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1063 [MSFTP2299US].

I. Real Party in Interest (37 C.F.R. §41.37(c)(1)(i))

The real party in interest in the present appeal is Microsoft Corporation, the assignee of the present application.

II. Related Appeals and Interferences (37 C.F.R. §41.37(c)(1)(ii))

Appellant, appellant's legal representative, and/or the assignee of the present application are not aware of any appeals or interferences which may be related to, will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims (37 C.F.R. §41.37(c)(1)(iii))

Claims 1-26 stand rejected by the Examiner. The rejection of claims 1-26 is being appealed.

IV. Status of Amendments (37 C.F.R. §41.37(c)(1)(iv))

Amendments have not been submitted after the final Office Action.

V. Summary of Claimed Subject Matter (37 C.F.R. §41.37(c)(1)(v))

A. Independent claim 1

Independent claim 1 recites [i]n a networked system, a device that is a computer subsystem. The computer subsystem comprises one or more services executing in the device (*see e.g.* Fig. 2A and related text at p. 6, lines 6-16), each service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service (*see e.g.* Figs. 2B and 2C and related text at p. 6, lines 6-25), wherein the one or more behaviors are described by behavior sentences (*see e.g.* Figs. 2B and 2C and related text at p. 7, lines 9-21), wherein the unilateral contract specifies an order of messages that flow in or out of services (*see e.g.* Figs. 2B an 2C and related text at p. 6, lines 15-16), wherein the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract or when the external service performs the unilateral contract according to the order of messages specified in the unilateral contract (*see e.g.* text at p. 8, lines 13-26), and wherein acceptance of the unilateral contract creates an instance of communication between services. (*See e.g.* text at p. 8,

lines 14-15).

B. Independent claim 6

Independent claim 6 recites [i]n a networked computer system, a terminal service comprising: a display service with a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the display service (*see e.g.* Fig. 2D and related text at p. 8, line 29 - p. 9, line 2; Fig. 2N and related text at p. 16, lines 17-26), wherein the one or more behaviors associated with a service are described by behavior sentences (*see e.g.* Figs. 2B and 2C and related text at p. 7, lines 9-21), wherein the unilateral contract is accepted when an other service promises to perform the unilateral contract in accordance with the one or more behaviors or when the other service performs the unilateral contract in accordance with the one or more behaviors, and wherein acceptance of the unilateral contract creates an instance of communication between the display service and another service. (*See e.g.* text at p. 8, lines 13-26).

C. Independent claim 16

Independent claim 16 recites [a] computer-implemented method for processing input/output events by devices as services, the method comprising: requesting a service representing a device for an input/output event, the service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service, the unilateral contract expressed in a language specifying an order of messages that flow in or out of services (*see e.g.* text at p. 14, lines 14-22); receiving a customizable, tag-based message that contains the input/output event (*see e.g.* text at p. 11, lines 8-29); and requesting the service to remove the input/output event. (*See e.g.* text at p. 20, lines 8-11).

D. Independent claim 21

Independent claim 21 recites [a] computer-readable medium having computer-executable instructions for implementing a computer-implemented method for processing input/output events by devices as services, the method comprising: requesting a service representing a device for an input/output event, the service including a port identifiable by an identifier that includes a

uniform resource identifier and a unilateral contract for describing one or more behaviors of the service (*see e.g.* text at p. 14, lines 14-22), wherein the one or more behaviors are described by behavior sentences (*see e.g.* Figs. 2B and 2C and related text at p. 7, lines 9-21), wherein the unilateral contract specifies an order of messages that flow in or out of services (*see e.g.* Figs. 2B an 2C and related text at p. 6, lines 15-16), wherein the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract or when the external service performs the unilateral contract according to the order of messages specified in the unilateral contract (*see e.g.* text at p. 8, lines 13-26), and wherein acceptance of the unilateral contract creates an instance of communication between services (*see e.g.* text at p. 8, lines 14-15); receiving a customizable, tag-based message that contains the input/output event (*see e.g.* text at p. 11, lines 8-29); and requesting the service to remove the input/output event. (*See e.g.* text at p. 20, lines 8-11).

E. Independent claim 26

Independent claim 26 recites [i]n a networked system, a device that is a computer subsystem, comprising: one or more services executing in the device (*see e.g.* Fig. 2A and related text at p. 6, lines 6-16), each service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service (*see e.g.* Figs. 2B and 2C and related text at p. 6, lines 6-25), wherein the port associated with the service comprises behavioral types (*see e.g.* Figs. 2B and 2C and related text at p. 6, lines 6-25), and wherein the device communicates with another device of the networked system based on compatibility of behavioral types (*see e.g.* text at p. 6, lines 9-13), the device being capable of coupling to the networked system to exchange customizable, tag-based messages. (*See e.g.* text at p. 11, lines 8-29).

VI. Grounds of Rejection to be Reviewed (37 C.F.R. §41.37(c)(1)(vi))

A. Whether claims 1-6, 16, 21, and 26 are unpatentable under 35 U.S.C. § 103(a) over Slaughter *et al.* (U.S. Patent No. 6,643,650) and Morciniec *et al.* (U.S. Patent Publication No. 2003/0074215).

B. Whether claims 7-15, 17-20, and 22-25 are unpatentable under 35 U.S.C. § 103(a) over Slaughter *et al.* (U.S. Patent No. 6,643,650), Morciniec *et al.* (U.S. Patent Publication No. 2003/0074215), and Hutsch *et al.* (U.S. Patent No. 7,269,664).

VII. Argument (37 C.F.R. §41.37(c)(1)(vii))

A. Rejection of Claims 1-6, 16, 21, and 26 Under 35 U.S.C. § 103(a)

Claims 1-6, 16, 21, and 26 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Slaughter *et al.* (U.S. Patent No. 6,643,650) in view of Morciniec *et al.* (U.S. Patent Publication No. 2003/0074215). This rejection should be withdrawn for at least the following reason: Slaughter *et al.* and Morciniec *et al.*, alone or in combination, do not teach or suggest each and every feature recited in the subject claims.

The claimed subject matter is directed to representing devices as services in a decentralized operating system. For example, devices can be transformed into Web services or special-purpose servers that are capable of communicating with other devices such as personal computers. Services representing devices communicate with each other by sending messages to each other. Unilateral contracts specify an order of messages that flow between services. (*See* applicant's specification at paragraphs 1 and 21-22). To this end, independent claim 1 recites ***one or more services executing in*** a ***device*** ... and a ***unilateral contract for describing one or more behaviors of the service***, wherein ***the one or more behaviors are described by behavior sentences***, wherein ***the unilateral contract specifies an order of messages that flow in or out of services***, wherein ***the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract*** or ... ***performs the unilateral contract according to the order of messages specified in the unilateral contract***, and wherein ***acceptance of the unilateral contract creates an instance of communication between services***.

Slaughter *et al.* is directed to a distributed computing environment for connecting network clients and services based on a message passing model. To this end, Slaughter *et al.* discloses searching for documents within spaces (*i.e.*, object repositories) of a distributed computing environment. Each space has an advertisement that a client of the space must first obtain in order to run a service associated with the space. A space's advertisement can include

an XML schema, credentials, and a Uniform Resource Identifier (URI) that indicate how a client of the space can access the space. In order to run a space's service, a client of the space can run an authentication service for the space to obtain an authentication token. (*See* Slaughter *et al.* at col. 1, lines 28-20; col. 7, lines 63-65; col. 8, lines 11-16; and col. 9, lines 5-67). However, Examiner conceded in the final Office Action that Slaughter *et al.* fails to teach or suggest a ***unilateral contract for describing one or more behaviors of the service***, wherein ***the one or more behaviors are described by behavior sentences***, wherein ***the unilateral contract specifies an order of messages that flow in or out of services***, wherein ***the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract*** or ... ***performs the unilateral contract according to the order of messages specified in the unilateral contract***, and wherein ***acceptance of the unilateral contract creates an instance of communication between services***.

Morciniec *et al.* is directed to an apparatus and method for binding business protocols to contract actions. To this end, Morciniec *et al.* discloses agreeing on a binding protocol for an e-contract; downloading the binding protocol and associated business protocol descriptor to a business protocol repository from a business protocol provider; and analyzing the structure of the e-contract using pre-assigned contract descriptors. The e-contract contains the text of a contract structured into ClauseGroups and Clauses stored in a TextualContract record. A reference stored in a field of the TextualContract record associates the TextualContract record with a FormalContract record. The FormalContract record has a field that lists contract roles (such as Buyer, Seller), and indicates in a field contract parties that will be fulfilling the contract roles. Once contract parties have agreed on a specific e-contract, they carry out the e-contract using a binding protocol. When both parties send acceptance messages, the binding protocol ends. (*See* Morciniec *et al.* at paragraphs 2, 9-10, 42-43, 58, and 88).

Although Morciniec *et al.* discloses that contract parties can use messaging systems to communicate with each other based on business protocol descriptions associated with an e-contract (*see* Morciniec *et al.* at paragraphs 30, 37, and 58), applicant's representative respectfully submits that, contrary to assertions made in the final Office Action, Morciniec *et al.* fails to teach or suggest a ***unilateral contract*** that ***specifies an order of messages that flow in or out of services*** and that describes ***one or more behaviors*** expressed ***by one or more behavior sentences***, wherein ***the unilateral contract is accepted when an external service promises to***

perform the unilateral contract according to the order of messages specified in the unilateral contract or ... ***performs the unilateral contract according to the order of messages specified in the unilateral contract***, and wherein ***acceptance of the unilateral contract creates an instance of communication between services***. Instead, Morciniec *et al.* discloses that two parties must accept a contract (*e.g.*, a bilateral contract) by sending acceptance messages. (*See* Morciniec *et al.* at paragraph 88). Further, unlike a unilateral contract of the subject invention performed in order of messages that describe the unilateral contract, the bilateral e-contract of Morciniec *et al.* is performed based on ClauseGroups and Clauses stored in a TextualContract record, and based on a FormalContract record associated with a bilateral e-contract. (*See* Morciniec *et al.* at paragraphs 42-43).

Dependent claim 3 recites ***the one or more services comprise a data service, the data service being capable of storing input/output events generated by the device and further being capable of responding to queries regarding the input/output events***. Contrary to assertions made in the final Office Action, it is respectfully submitted that Slaughter *et al.* fails to disclose or suggest ***the one or more services comprise a data service, the data service being capable of storing input/output events generated by the device and further being capable of responding to queries regarding the input/output events***. Rather, Slaughter *et al.* merely discloses event gates that can recognize events published by a service, subscribe to those events, and distribute each event as the event is produced by the service. (*See* Slaughter *et al.* at col. 31, line 61 to col. 32, line 2).

Independent claim 6 recites ***a unilateral contract for describing one or more behaviors of*** a ***display service***, wherein ***the one or more behaviors associated with a service are described by behavior sentences***, wherein ***the unilateral contract is accepted when an other service promises to perform the unilateral contract in accordance with the one or more behaviors*** or when ***the other service performs the unilateral contract in accordance with the one or more behaviors***, and wherein ***acceptance of the unilateral contract creates an instance of communication between the display service and another service***. Examiner concedes in the final Office Action that Slaughter *et al.* fails to teach or suggest the novel features recited in claim 6.

Further, counter to imitations in the final Office Action that Morciniec *et al.* discloses the claimed invention, it is readily apparent that ***a unilateral contract for describing one or more***

behaviors of a ***display service***, wherein ***the one or more behaviors associated with a service are described by behavior sentences***, wherein ***the unilateral contract is accepted when an other service promises to perform the unilateral contract in accordance with the one or more behaviors*** or when ***the other service performs the unilateral contract in accordance with the one or more behaviors***, and wherein ***acceptance of the unilateral contract creates an instance of communication between the display service and another service*** is neither taught nor suggested by the cited art. Instead, Morciniec *et al.* merely discloses that two parties form a bilateral contract because they both must send acceptance messages to form a contract. (*See* Morciniec *et al.* at paragraph 88). Further, unlike a unilateral contract of the subject invention that describes one or more behaviors associated with a display service and that is performed in accordance with the one or more behaviors, the bilateral e-contract of Morciniec *et al.* is performed based on ClauseGroups and Clauses stored in a TextualContract record, and based on a FormalContract record associated with the bilateral e-contract. (*See* Morciniec *et al.* at paragraphs 42-43).

Independent claim 16 recites a ***method for processing input/output events by devices as services***...comprising: ***requesting a service representing a device for an input/output event, the service including...a unilateral contract for describing one or more behaviors of the service, the unilateral contract expressed in a language specifying an order of messages that flow in or out of services***; ***receiving a customizable, tag-based message that contains the input/output event***; ***and requesting the service to remove the input/output event***. Applicant's representative respectfully submits that Examiner has failed to indicate in the final Office Action where Slaughter *et al.* teaches or suggests a ***method for processing input/output events by devices as services***; therefore, Examiner has failed to make a prima facie case of obviousness under 35 U.S.C. § 103(a). Further, applicant's representative respectfully avers to the contrary that Slaughter *et al.* fails to teach or suggest ***requesting a service representing a device for an input/output event***. Rather, Slaughter *et al.* merely discloses an event gate may subscribe itself as a consumer of an event. (*See* Slaughter *et al.* at col. 32, lines 5-6). Moreover, it is respectfully submitted that Slaughter *et al.* and Morciniec *et al.*, alone or in combination, fail to teach or suggest ***a unilateral contract for describing one or more behaviors of the service, the unilateral contract expressed in a language specifying an order of messages that flow in or out***

of services; ***receiving a customizable, tag-based message that contains the input/output event***; ***and requesting the service to remove the input/output event.***

Independent claim 21 recites ***requesting a service representing a device for an input/output event***, ***the service including...a unilateral contract for describing one or more behaviors of the service***, wherein ***the one or more behaviors are described by behavior sentences***, wherein ***the unilateral contract specifies an order of messages that flow in or out of services***, wherein ***the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract*** or when ***the external service performs the unilateral contract according to the order of messages specified in the unilateral contract***, and wherein ***acceptance of the unilateral contract creates an instance of communication between services***; ***receiving a customizable, tag-based message that contains the input/output event***; and ***requesting the service to remove the input/output event***. It is readily apparent that Slaughter *et al.* fails to teach or suggest ***requesting a service representing a device for an input/output event***. Instead, Slaughter *et al.* merely discloses an event gate may subscribe itself as a consumer of an event. (*See* Slaughter *et al.* at col. 32, lines 5-6). Further, it is respectfully submitted that Morciniec *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of the service***, wherein ***the one or more behaviors are described by behavior sentences***, wherein ***the unilateral contract specifies an order of messages that flow in or out of services***, wherein ***the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract*** or when ***the external service performs the unilateral contract according to the order of messages specified in the unilateral contract***, and wherein ***acceptance of the unilateral contract creates an instance of communication between services***; ***receiving a customizable, tag-based message that contains the input/output event***; and ***requesting the service to remove the input/output event***. Rather, Morciniec *et al.* merely provides that contract parties can use messaging systems to communicate with each other based on business protocol descriptions associated with an e-contract. (*See* Morciniec *et al.* at paragraphs 30 and 37).

Independent claim 26 recites ***a unilateral contract for describing one or more behaviors of*** a ***service***, wherein a ***port associated with the service comprises behavioral types***, and wherein ***the device communicates with another device of the networked system based on compatibility***

of behavioral types. Applicant's representative respectfully submits that, contrary to assertions made in the Office Action, Morciniec *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of*** a ***service***, wherein a ***port associated with the service comprises behavioral types***, and wherein ***the device communicates with another device of the networked system based on compatibility of behavioral types***. Instead, Morciniec *et al.* merely provides for fields included in a contract record, an Embodiment field is included in a CommitmentSubject record upon contract agreement, and two parties exchange messages according to a protocol after contract agreement. (*See* Morciniec *et al.* at paragraphs 45, 56, and 58). Further, although Slaughter *et al.* discloses an XML schema can be viewed as defining a contract with a service (*see* Slaughter *et al.* at col. 23, lines 25-55), Slaughter *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of*** a ***service***, wherein a ***port associated with the service comprises behavioral types***, and wherein ***the device communicates with another device of the networked system based on compatibility of behavioral types***.

In view of at least the foregoing, it is readily apparent that Slaughter *et al.* and Morciniec *et al.*, alone or in combination, do not teach or suggest each and every features of the claimed subject matter as recited in independent claims 1, 6, 16, 21, and 26 (and associated dependent claims). Accordingly, withdrawal of this rejection is respectfully requested.

B. Rejection of Claims 7-15, 17-20, and 22-25 Under 35 U.S.C. § 103(a)

Claims 7-15, 17-20, and 22-25 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Slaughter *et al.* and Morciniec *et al.* in view of Hutsch *et al.* (U.S. Patent No. 7,269,664). This rejection should be withdrawn for at least the following reason: Slaughter *et al.*, Morciniec *et al.*, and Hutsch *et al.*, alone or in combination, do not teach or suggest each and every feature recited in the subject claims.

Dependent claim 7 recites a ***display service*** that ***includes a cursor shape service for describing the shape on an on-screen cursor*** ... and ***a unilateral contract for describing one or more behaviors of the cursor shape service***. Although Slaughter *et al.* discloses an XML schema can be viewed as defining a contract with a service (*see* Slaughter *et al.* at col. 23, lines 25-55), applicant's representative respectfully submits that, contrary to assertions made in the

final Office Action, Slaughter *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of the cursor shape service***.

Hutsch *et al.* is directed to a network portal system. However, contrary to assertions made in the final Office Action , it is respectfully submitted that Hutsch *et al.* fails to teach or suggest a ***display service*** that ***includes a cursor shape service for describing the shape on an on-screen cursor***. Rather, Hutsch *et al.* merely provides for interpretation of a scroll action by a windowing environment and a scroll command set by the windowing environment.

Dependent claim 8 recites ***a unilateral contract for describing one or more behaviors of the cursor position service***. Counter to imitations in the final Office Action that Slaughter *et al.* discloses the claimed invention, it is readily apparent that ***a unilateral contract for describing one or more behaviors of the cursor position service*** is neither taught nor suggested by the cited art. Instead, Slaughter *et al.* merely discloses an XML schema can be viewed as defining a contract with a service. (*See* Slaughter *et al.* at col. 23, lines 25-55).

Dependent claims 9, 17, and 22 recite ***a unilateral contract for describing one or more behaviors of the window service***. Applicant's representative respectfully avers to the contrary that Slaughter *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of the window service***. Rather, Slaughter *et al.* merely discloses an XML schema can be viewed as defining a contract with a service. (*See* Slaughter *et al.* at col. 23, lines 25-55).

Dependent claim 10 recites ***a unilateral contract for describing one or more behaviors of the window list service***. It is respectfully submitted that Slaughter *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of the window list service***. Instead, Slaughter *et al.* merely discloses an XML schema can be viewed as defining a contract with a service. (*See* Slaughter *et al.* at col. 23, lines 25-55).

Dependent claim 11 recites ***a unilateral contract for describing one or more behaviors of the window update service***. It is readily apparent that Slaughter *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of the window update service***. Rather, Slaughter *et al.* merely discloses an XML schema can be viewed as defining a contract with a service. (*See* Slaughter *et al.* at col. 23, lines 25-55).

Dependent claim 12 recites ***a unilateral contract for describing one or more behaviors of the keyboard service***. Applicant's representative respectfully submits that, contrary to assertions made in the final Office Action, Slaughter *et al.* fails to teach or suggest ***a unilateral***

contract for describing one or more behaviors of the keyboard service. Instead, Slaughter *et al.* merely discloses an XML schema can be viewed as defining a contract with a service. (*See* Slaughter *et al.* at col. 23, lines 25-55).

Dependent claim 14 recites ***a unilateral contract for describing one or more behaviors of the mouse service***. Contrary to assertions made in the final Office Action, it is respectfully submitted that Slaughter *et al.* fails to teach or suggest ***a unilateral contract for describing one or more behaviors of the mouse service***. Rather, Slaughter *et al.* merely discloses an XML schema can be viewed as defining a contract with a service. (*See* Slaughter *et al.* at col. 23, lines 25-55).

Moreover, Hutsch *et al.* does not make up for the aforementioned deficiencies of Slaughter *et al.* and Morciniec *et al.* with respect to independent claims 6, 16, and 21. Claims 7-15 properly depend from claim 6, and are patentable over the cited art for at least the same reasons as is claim 6. Claims 17-20 properly depend from claim 16, and are patentable over the cited art for at least the same reasons as is claim 16. Claims 22-25 properly depend from claim 21, and are patentable over the cited art for at least the same reasons as is claim 21. Accordingly, withdrawal of this rejection is respectfully requested.

C. Conclusion

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejections of claims 1-26 be reversed.

If any additional fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP2299US].

Respectfully submitted,

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VIII. Claims Appendix (37 C.F.R. §41.37(c)(1)(viii))

1. (Previously Presented) In a networked system, a device that is a computer subsystem, comprising:

one or more services executing in the device, each service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service, wherein the one or more behaviors are described by behavior sentences, wherein the unilateral contract specifies an order of messages that flow in or out of services, wherein the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract or when the external service performs the unilateral contract according to the order of messages specified in the unilateral contract, and wherein acceptance of the unilateral contract creates an instance of communication between services.

2. (Original) The device of Claim 1, wherein the one or more services comprise an information service, the information service being capable of producing a customizable, tag-based document for describing the capabilities of the device.

3. (Original) The device of Claim 1, wherein the one or more services comprise a data service, the data service being capable of storing input/output events generated by the device and further being capable of responding to queries regarding the input/output events.

4. (Previously Presented) The device of Claim 1, further comprising a network device driver that enables communication between services.

5. (Original) The device of Claim 1, further comprising a decentralized operating system on which the one or more services are executed.

6. (Previously Presented) In a networked computer system, a terminal service comprising:

a display service with a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the display service, wherein the one or more behaviors associated with a service are described by behavior sentences, wherein the unilateral contract is accepted when an other service promises to perform the unilateral contract in accordance with the one or more behaviors or when the other service performs the unilateral contract in accordance with the one or more behaviors, and wherein acceptance of the unilateral contract creates an instance of communication between the display service and another service.

7. (Previously Presented) The terminal service of Claim 6, wherein the display service includes a cursor shape service for describing the shape on an on-screen cursor, the cursor shape service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the cursor shape service.

8. (Previously Presented) The terminal service of Claim 6, wherein the display service includes a cursor position service for describing the position of an on-screen cursor, the cursor position service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the cursor position service.

9. (Previously Presented) The terminal service of Claim 6, wherein the display service includes a window service for describing a window, the window service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the window service.

10. (Previously Presented) The terminal service of Claim 9, wherein the display service includes a window list service for containing a list of window services appearing on a display, the window list service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the window list service.

11. (Previously Presented) The terminal service of Claim 10, wherein the display service includes a window update service for refreshing a window represented by a window service, the window update service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the window update service.

12. (Previously Presented) The terminal service of Claim 6, further comprising a keyboard service with a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the keyboard service.

13. (Previously Presented) The terminal service of Claim 12, wherein the keyboard service includes a data service for containing keyboard events generated by a keyboard, the data service being capable of responding to queries to remove keyboard events for processing.

14. (Previously Presented) The terminal service of Claim 6, further comprising a mouse service, the mouse service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the mouse service.

15. (Original) The terminal service of Claim 14, wherein the mouse service includes a data service for containing mouse events generated by a mouse, the data service being capable of responding to queries to remove mouse events for processing.

16. (Previously Presented) A computer-implemented method for processing input/output events by devices as services, the method comprising:

requesting a service representing a device for an input/output event, the service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service, the unilateral contract expressed in a language specifying an order of messages that flow in or out of services;

receiving a customizable, tag-based message that contains the input/output event; and

requesting the service to remove the input/output event.

17. (Previously Presented) The method of Claim 16, further comprising requesting the service for creating a window, the act of creating a window creating a window service with a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the window service.

18. (Previously Presented) The method of Claim 17, further comprising requesting the service for refreshing the window, the act of requesting invoking a window update service that repaints the window.

19. (Previously Presented) The method of Claim 16, further comprising requesting the service to change a cursor shape, the act of requesting invoking a cursor shape service that changes the shape of the cursor.

20. (Previously Presented) The method of Claim 16, further comprising requesting the service to change a position of a cursor, the act of requesting invoking a cursor position service that changes the position of the cursor.

21. (Previously Presented) A computer-readable medium having computer-executable instructions for implementing a computer-implemented method for processing input/output events by devices as services, the method comprising:

requesting a service representing a device for an input/output event, the service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service, wherein the one or more behaviors are described by behavior sentences, wherein the unilateral contract specifies an order of messages that flow in or out of services, wherein the unilateral contract is accepted when an external service promises to perform the unilateral contract according to the order of messages specified in the unilateral contract or when the external service performs the unilateral contract according to the order of messages specified in the unilateral contract, and wherein acceptance of the unilateral contract creates an instance of communication between services;

receiving a customizable, tag-based message that contains the input/output event; and

requesting the service to remove the input/output event.

22. (Previously Presented) The computer-readable medium of Claim 21, further comprising requesting the service for creating a window, the act of creating a window creating a window service with a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the window service.

23. (Previously Presented) The computer-readable medium of Claim 22, further comprising requesting the service for refreshing the window, the act of requesting invoking a window update service that repaints the window.

24. (Previously Presented) The computer-readable medium of Claim 21, further comprising requesting the service to change a cursor shape, the act of requesting invoking a cursor shape service that changes the shape of the cursor.

25. (Previously Presented) The computer-readable medium of Claim 21, further comprising requesting the service to change a position of a cursor, the act of requesting invoking a cursor position service that changes the position of the cursor.

26. (Previously Presented) In a networked system, a device that is a computer subsystem, comprising:

one or more services executing in the device, each service including a port identifiable by an identifier that includes a uniform resource identifier and a unilateral contract for describing one or more behaviors of the service, wherein the port associated with the service comprises behavioral types, and wherein the device communicates with another device of the networked system based on compatibility of behavioral types, the device being capable of coupling to the networked system to exchange customizable, tag-based messages.

IX. Evidence Appendix (37 C.F.R. §41.37(c)(1)(ix))

None.

X. Related Proceedings Appendix (37 C.F.R. §41.37(c)(1)(x))

None.